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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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### Office Action Summary

**Application No.**

10/776,004

**Applicant(s)**

YACH ET AL.

**Examiner**

ROBERT TIMBLIN

**Art Unit**

2167

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 August 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 5) ☒ Claim(s) 1, 2, 5-7, 9, 12-15 and 18-25 is/are pending in the application.
- 5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 1, 2, 5-7, 9, 12-15, and 18-25 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB08)  
Paper No(s)/Mail Date \_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

### **DETAILED ACTION**

This Office Action corresponds to application 10/776,004 filed 2/10/2004.

#### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/25/2011 has been entered.

#### ***Response to Amendment***

In the response filed 8/25/2011, claims 1, 15, and 23 have been amended while no claims have been added or cancelled. Accordingly, claims 1, 2, 5-7, 9, 12-15, and 18-25 remain pending prosecution.

#### ***Claim Objections***

Claim 1 is objected to because it recites "second hash second message" and "first hash first message". Accordingly, these are rather interpreted as "second message" and "first message". Clarification is respectfully requested.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 2, 9, 12, 13, 15, 18, 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Livschitz (U.S. Patent 6,470,329) in view of Yianilos et al. ('Yianilos' hereafter, U.S. Patent Application 2002/0029214).**

With respect to claim 1, Livschitz teaches A mobile node (col. 9 line 49; PDA device) of a radio communication system (fig. 9 and col. 9 line 49-50) having a network part (col. 9 line 50; PDA server) and the mobile node (col. 9 line 49; PDA device), the network part having a network-copy of a database containing database records and database values of the database (col. 5 line 56-57) and the mobile node (col. 9 line 49; PDA device) having a mobile-copy of the database (fig. 2, M1) containing database records and database values of the database (col. 5 line 56-57), the database records and database values of the database of the network-copy (Figs 1-9; e.g. M2) and the mobile-copy of the database, respectively, correspond to each other when the network-copy and the mobile-copy of the database are in match with one another (col. 2 lines 38-40; e.g. when the databases are in synchronization, they are in match with one another), said mobile node comprising:

processing circuitry (80) coupled to the mobile-copy database (86), said processing circuitry configured to:

i) generate a first hash (Fig. 1, 8; e.g. a first hash in a recursive hashing process) and communicate said first hash to the network part on a communications channel of the radio communication system, whereby an out of match condition between the mobile-copy database values and the network-copy database values is determined (fig. 1 wherein the hash signature is communicated over line 6 to determine if a match is present),

ii) generate, upon a determination of an out of match condition between mobile-copy database values and network-copy database values (col. 8 lines 14-15; e.g. "If the signature  $g(hA)$  is not identical to  $g(hB)$ "), a second hash (figs. 2, 3 and col. 6 lines 18-25; e.g. the databases are recursively hashed in a sequence of steps to teach at least a first and second hash) based upon the database records in the mobile-copy database (col. 5 line 34; e.g. signature of a data set), and communicate said second hash to the network part on said communications channel (col. 6 line 59-60 and Figs 1 and 2 drawing references 6 and 18 wherein the signatures are disclosed as transferred), whereby an out of match condition between a record of the mobile-copy database records and a corresponding record of the network-copy database records is determined (col. 6 lines 32-35; e.g. differences in the data blocks are determined),

iii) retrieve the out of match database record (col. 10 lines 15-21) from the mobile-copy database upon a determination of an out of match condition between said mobile-copy database record and said corresponding network-copy database record for

communication to the network part (col. 7 lines 10-14; e.g. "after the recursive process all remaining elementary data blocks of the data set A are transferred and copied"), whereby to match the network-copy database records and the mobile-copy database records are matched to each other (col. 7 line 31; e.g. the data sets A and B are synchronized);

wherein the radio communication system provides bi-directional (col. 9 lines 49-60 wherein the PDA device is synchronized to the server; therein data synchronized between the PDA server and PDA device describes bi-directional data communications) data communications services to said mobile node part (fig. 9, reference 84), and wherein data is communicated from the mobile node to the network by an up-link (col. 9 lines 60-61; e.g. the PDA device uses a wireless connectivity to upload the schedule; therein, uploading is interpreted as using an up-link) and, data is communicated from the network part to the mobile node by a down-link (col. 1 lines 34-35; e.g. data is transferred between an original data set and remote copy and col. 10 lines 15-18; e.g. the PDA server returns a 365-bit mask to the PDA device).

Although Livschitz teaches generating a first hash (e.g. Fig. 1) and second hash (e.g. a one-way hash function is regenerated via recursive process), Livschitz does not appear to expressly describe i) generating the first hash pursuant to a first hash technique of a first computational intensity and based on values, and generating the second hash pursuant to a second hash technique of a second computational intensity, and in which said second computational intensity is greater than said first computational intensity and requires a greater amount of communication channel capacity to

communicate said second hash than first hash. Livschitz also teaches communicating a first and a second hash but does not appear to teach communicating a first and a second hash in a first message and second message with a greater amount of communication channel capacity required to communicate said second hash message than said first hash message.

Yianilos, however, teaches i) generating the first hash pursuant to a first hash technique (0071, 0076, and 0083; e.g. "Get\_Interval\_Hashes") of a first computational intensity (0077; e.g.  $O(h+t)$  and 0083 wherein this function computes a summary of all records) and based on values (0071 and 0073), and generating the second hash pursuant to a second hash technique (0070, 0075, and 0083; e.g. "Get\_All\_Hashes") of a second computational intensity (0075; e.g.  $O(h+m)$  and 0083 wherein this function computes digests (hashes) of all individual records), and in which said second computational intensity is greater than said first computational intensity (0083 wherein the first hash computes a single summary and the second hash technique computes a digest for individual records) and requires a greater amount of communication channel capacity to communicate said second hash than first hash (0085 wherein "Get\_All\_Hashes" includes communications rounds that generate heavy network traffic). Yianilos also teaches communicating a first message (0081 and 0083 wherein Get\_Interval\_Hashes transmits a digest (hash) in a summary) and a second hash message (0083-0085 wherein a digest of a record is transmitted in a communication round) with a greater amount of communication channel capacity to communicate said second hash message than said first hash message (0085 wherein every

communication round for Get\_All\_Hashes generates heavy network traffic ) for utilizing efficient hash techniques in order to determine probable matches.

Accordingly, in the same field of endeavor (i.e. hash functions), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because the hashing techniques as provided by Yianilos would have given Livschitz the ability to use a first hash technique with small computational overhead to compute differences upfront (e.g. needed by Livschitz, col. 7 line 67). Further, with Livschitz (who is capable of calculating different hashing techniques – see Fig. 8) first hash technique (as provided by Yianilos) upfront, a system using a second hash technique when a stronger calculation is needed (see Yianilos, 0083) would have been provided for the benefit of saving computational costs and minimizing network traffic (provided by Yianilos, 0080 and needed by Livschitz, col. 8, lines 66-67).

With respect to claim 2, Livschitz teaches the apparatus of claim 1 wherein said processing circuitry generates said first hash responsive to an external triggering event, occurrence of which is detectable at the mobile node (col. 9 line 50-56).

With respect to claim 9, Livschitz teaches the apparatus of claim 8 wherein hashes generated by a network part processing circuitry include a first hash (Fig. 1) and based upon the database values of the network-copy database (Fig. 1 data sets A and B), and a second hash (fig. 2, 3 and col. 6 lines 18-25; e.g. the databases are



recursively hashed in a sequence of steps to teach at least a first and second hash) pursuant to a second hash technique (col. 5 line 30; e.g. one-way hash function) of a second computational intensity (col. 5 line 33-35) and based upon the database records in the network-copy database (Fig. 1 data sets A and B).

Livschitz does not appear to teach the first hash is pursuant to a first hash technique of a first computational intensity.

Yianilos, however teaches the first hash is pursuant to a first hash technique of a first computational intensity (0083) for providing multiple hash techniques.

Accordingly, in the same field of endeavor (i.e. hash functions), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references for the rationale stated above.

With respect to claim 12, Livschitz teaches the apparatus of claim 8 further comprising circuitry configured to receive out of match the values of the at least the portions of the data records responsive a comparison of a second hash of said the values with corresponding values network-copy database records with a second hash of said mobile-copy database records (fig. 3 and col. 7 lines 45-48).

With respect to claim 13, Livschitz teaches the apparatus of claim 12 further comprising database updater circuitry (col. 10, line 20), configured to alter at least one

record of a selected one of the mobile-copy database and the network-copy database (col. 10, line 20; e.g. updating is seen as altering).

With respect to claim 15, Livschitz teaches A method of communicating in a radio communication system (fig. 9 and col. 9 line 49-50) having a network part that maintains at least a network-copy of a database containing database records and database values of the database (col. 5 line 56-57) and a mobile node (col. 9 line 49; PDA device) that maintains a mobile-copy (fig. 2, M1) of the database containing database records and database values of the database the database records and database values of the database of the network-copy (Figs 1-9; e.g. M2) and the mobile-copy of the database, respectively, correspond when the network-copy database and the mobile-copy database are in match with one another (col. 2 lines 38-40; e.g. when the databases are in synchronization, they are in match with one another), the method altering at least one database record the data of at least one of the network-copy database and the mobile-copy database to place the network-copy and the mobile-copy in match with each other (col. 10 lines 15-21), the method comprising:

generating at the mobile (80) node a first hash (Fig. 1, 8; e.g. a first hash in a recursive hashing process), when the network-copy database and the mobile-copy database are suspected of being out of synchronization with each other (col. 6 line 41-49 col. 9 line 52-56);

sending said first hash value from the mobile node to the network part on a communications channel of the radio communication system (Fig. 1 line 6), whereby an

out of match condition between the mobile-copy database values and the network-copy database values is determined (fig. 1 wherein the hash signature is communicated over line 6 to determine if a match is present);

receiving, at the mobile node M1), indication of results of a comparison (figs. 1-3; e.g. if the results indicate non-identical portions, mobile node M1 performs the hashing function again; therein the mobile node needs an indication of comparison in order to hash again) at the network part (M2), of said first hash value sent during said operation of sending, to a corresponding network-copy of said first hash value (fig. 1, reference 6); and

when said indication of results of the comparison of said first hash value generated at the mobile node to a corresponding network-copy of said first hash value indicates that the mobile-copy database and the network copy database are out of match (col. 6 line 32-58; e.g. the process if the portions are not identical, or, out of match), thereafter generating a second hash at the mobile node (fig. 2, 3 and col. 6 lines 18-25; e.g. the databases are recursively hashed in a sequence of steps to teach at least a first and second hash) based upon the database records in the mobile-copy database (col. 5 line 34; e.g. signature of a data set); and

sending said second hash value from the mobile node to the network part on said communications channel for comparison to a corresponding network-copy of the second hash value (col. 6 line 59-60 and Figs 1 and 2 drawing references 6 and 18 wherein the signatures are disclosed as transferred), whereby an out of match condition between a record of the mobile-copy database records and a corresponding record of the network-

copy database records is determined (fig. 1 wherein the hash signature is communicated over line 6 to determine if a match is present);

wherein the radio communication system provides bi-directional (col. 9 lines 49-60 wherein the PDA device is synchronized to the server; therein data synchronized between the PDA server and PDA device describes bi-directional data communications) data communications services to said mobile node part (fig. 9, reference 84), and wherein data is communicated from the mobile node to the network by an up-link (col. 9 lines 60-61; e.g. the PDA device uses a wireless connectivity to upload the schedule; therein, uploading is interpreted as using an up-link) and, data is communicated from the network part to the mobile node by a down-link (col. 1 lines 34-35; e.g. data is transferred between an original data set and remote copy and col. 10 lines 15-18; e.g. the PDA server returns a 365-bit mask to the PDA device).

Although Livschitz teaches generating a first hash (e.g. Fig. 1) and second hash (e.g. a one-way hash function is regenerated via recursive process), Livschitz does not appear to expressly describe i) generating the first hash pursuant to a first hash technique of a first computational intensity and based on values, and generating the second hash pursuant to a second hash technique of a second computational intensity, and in which said second computational intensity is greater than said first computational intensity and requires a greater amount of communication channel capacity to communicate said second hash than first hash. Livschitz also teaches communicating a first and a second hash but does not appear to teach communicating a first and a second hash in a first message and second message with a greater amount of

communication channel capacity required to communicate said second hash message than said first hash message.

Yianilos, however, teaches i) generating the first hash pursuant to a first hash technique (0071, 0076, and 0083; e.g. "Get\_Interval\_Hashes") of a first computational intensity (0077; e.g.  $O(h+t)$  and 0083 wherein this function computes a summary of all records) and based on values (0071 and 0073), and generating the second hash pursuant to a second hash technique (0070, 0075, and 0083; e.g. "Get\_All\_Hashes") of a second computational intensity (0075; e.g.  $O(h+m)$  and 0083 wherein this function computes digests (hashes) of all individual records), and in which said second computational intensity is greater than said first computational intensity (0083 wherein the first hash computes a single summary and the second hash technique computes a digest for individual records) and requires a greater amount of communication channel capacity to communicate said second hash than first hash (0085 wherein "Get\_All\_Hashes" includes communications rounds that generate heavy network traffic). Yianilos also teaches communicating a first message (0081 and 0083 wherein Get\_Interval\_Hashes transmits a digest (hash) in a summary) and a second hash message (0083-0085 wherein a digest of a record is transmitted in a communication round) with a greater amount of communication channel capacity to communicate said second hash message than said first hash message (0085 wherein every communication round for Get\_All\_Hashes generates heavy network traffic ) for utilizing efficient hash techniques in order to determine probable matches.

Accordingly, in the same field of endeavor (i.e. hash functions), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because the hashing techniques as provided by Yianilos would have given Livschitz the ability to use a first hash technique with small computational overhead to compute differences upfront (e.g. needed by Livschitz, col. 7 line 67). Further, with Livschitz (who is capable of calculating different hashing techniques – see Fig. 8) first hash technique (as provided by Yianilos) upfront, a system using a second hash technique when a stronger calculation is needed (see Yianilos, 0083) would have been provided for the benefit of saving computational costs and minimizing network traffic (provided by Yianilos, 0080 and needed by Livschitz, col. 8, lines 66-67).

With respect to claim 18, Livschitz teaches the method of claim 15 further comprising the operations of delivering of the mobile-copy database records to the network part, comparing said delivered records with corresponding records of the network-copy database records of the at least the first database, and causing overwriting of at least portions of a selected one of the network- copy database records and the mobile-copy database records responsive to a determination of an out of match condition between a record of the mobile-copy database records and a corresponding record of the network-copy database records comparisons made during said operation of comparing the portions of the mobile copy (col. 10 lines 18-21).

With respect to claim 23, Livschitz teaches A mobile node (col. 9 line 49; PDA device) of a radio communication system (fig. 9 and col. 9 line 49-50) having a network part (col. 9 line 50; PDA server) and the mobile node (col. 9 line 49; PDA device), the network part having a network-copy of a database containing database records and database values of the database (col. 5 line 56-57) and the mobile node (col. 9 line 49; PDA device) having a mobile-copy of the database (fig. 2, M1) containing database records and database values of the database (col. 5 line 56-57), the database records and database values of the database of the network-copy (Figs 1-9; e.g. M2) and the mobile-copy of the database, respectively, correspond to each other when the network-copy and the mobile-copy of the database are in match with one another (col. 2 lines 38-40; e.g. when the databases are in synchronization, they are in match with one another), said mobile node comprising:

receive circuitry (col. 20, receiver) configured to receive signals transmitted by a network part transmitter (Fig. 1);

transmit circuitry (col. 5 line 22, sender) configured to transmit signals to a network part on a communications channel (Fig. 1);

a memory element storing at least one mobile-copy database (86); and

processing circuitry coupled to said receive circuitry (80), said transmit circuitry, and said memory element, and including:

a request detector (col. 3 line 23),

a hash generator to generate (col. 3 line 23; e.g. an agent that computes a signature), in response to said request detector detecting an external triggering event

(col. 9 line 50-56), a first hash (Fig. 1, 8; e.g. a first hash in a recursive hashing process) of the mobile-copy database (col. 5 line 26-27), said first hash being communicated to the network part via said transmit circuitry on said communications channel (Figs. 1, 2; drawing references 6, 18, 20), whereby an out of match condition between the mobile-copy database values and the network-copy database values is determined (col. 6 lines 32-35; e.g. differences in the data blocks are determined), and to generate, upon a determination of an out of match condition between mobile-copy database values and network-copy database values (col. 8 lines 14-15; e.g. "If the signature  $g(hA)$  is not identical to  $g(hB)$ ") being received from the network part via said receive circuitry, a second hash (fig. 2, 3 and col. 6 lines 18-25; e.g. the databases are recursively hashed in a sequence of steps to teach at least a first and second hash) based upon the database records in the mobile-copy database col. 5 line 34; e.g. signature of a data set), said second hash being communicated to the network part via said transmit circuitry on said communications channel (Figs. 1, 2; drawing references 6, 18, 20), whereby an out of match condition between a record of the mobile-copy database records and a corresponding record of the network-copy database records is determined (col. 6 lines 32-35; e.g. differences in the data blocks are determined), and

a content retriever (Fig. 4; e.g. receiving a copy) to retrieve the out of match database record from the mobile-copy database upon reception via said receive circuitry of a determination of an out of match condition between said mobile-copy database record and said corresponding network-copy database record for communication to the network part (Fig. 4 and col. 10 lines 19-21), whereby the



network-copy database records and the mobile-copy database records are matched to each other (col. 7 line 31; e.g. the data sets A and B are synchronized).

Although Livschitz teaches generating a first hash (e.g. Fig. 1) and second hash (e.g. a one-way hash function is regenerated via recursive process), Livschitz does not appear to expressly describe i) generating the first hash pursuant to a first hash technique of a first computational intensity and based on values, and generating the second hash pursuant to a second hash technique of a second computational intensity, and in which said second computational intensity is greater than said first computational intensity and requires a greater amount of communication channel capacity to communicate said second hash than first hash.

Yianilos, however, teaches i) generating the first hash pursuant to a first hash technique (0071, 0076, and 0083; e.g. "Get\_Interval\_Hashes") of a first computational intensity (0077; e.g.  $O(h+t)$  and 0083 wherein this function computes a summary of all records) and based on values (0071 and 0073), and generating the second hash pursuant to a second hash technique (0070, 0075, and 0083; e.g. "Get\_All\_Hashes") of a second computational intensity (0075; e.g.  $O(h+m)$  and 0083 wherein this function computes digests (hashes) of all individual records), and in which said second computational intensity is greater than said first computational intensity (0083 wherein the first hash computes a single summary and the second hash technique computes a digest for individual records) and requires a greater amount of communication channel capacity to communicate said second hash than first hash (0085 wherein "Get\_All\_Hashes" includes communications rounds that generate heavy network traffic).

Yianilos also teaches communicating a first message (0081 and 0083 wherein Get\_Interval\_Hashes transmits a digest (hash) in a summary) and a second hash message (0083-0085 wherein a digest of a record is transmitted in a communication round) with a greater amount of communication channel capacity to communicate said second hash message than said first hash message (0085 wherein every communication round for Get\_All\_Hashes generates heavy network traffic ) for utilizing efficient hash techniques in order to determine probable matches.

Accordingly, in the same field of endeavor (i.e. hash functions), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because the hashing techniques as provided by Yianilos would have given Livschitz the ability to use a first hash technique with small computational overhead to compute differences upfront (e.g. needed by Livschitz, col. 7 line 67). Further, with Livschitz (who is capable of calculating different hashing techniques – see Fig. 8) first hash technique (as provided by Yianilos) upfront, a system using a second hash technique when a stronger calculation is needed (see Yianilos, 0083) would have been provided for the benefit of saving computational costs and minimizing network traffic (provided by Yianilos, 0080 and needed by Livschitz, col. 8, lines 66-67).

With respect to claim 25, Livschitz teaches the mobile node of claim 23 wherein said transmit circuitry and said processing circuitry are adapted to deliver mobile-copy database records to the network part, responsive to a determination of an out of match

condition between a record of the mobile-copy database records and a corresponding record of the network-copy database records (col. 10 lines 15-21).

**Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Livschitz and Yianilos as applied to parent claims 1 and 23 above, and further in view of Nguyen (U.S. Patent 5,809,494).**

With respect to claim 5, Livschitz and Yianilos teach a database with records (e.g. Livschitz col. 1 line 57-78 and col. 5 lines 55-56 and Yianilos Fig. 2) and hashing contents but do not appear to expressly teach the apparatus of claim 1 wherein the database records maintained at the network-copy database and the mobile-copy database are comprised of a first key field and at least a first record field for each database record, and wherein said second hash comprises a hash of said first key field of each database record.

Nguyen, however, teaches the apparatus of claim 1 wherein the database records maintained at the network-copy database and the mobile-copy database are comprised of data including at least a first key field and at least a first record field for each database record, and wherein said second hash comprises a hash of said first key field of each database record (col. 1 lines 54-65) for teaching a hashing function that hashes key fields.

Accordingly, in the same field of endeavor, (i.e. hashing techniques), it would have been obvious to one of ordinary skill in the data processing art at the time of the

present invention to combine the teachings of the cited references because the hash value as provided by Nguyen would have given Livschitz and Yianilos a hash of a key field of a record for the benefit of providing an identifying key on which to compare records. Thus a more efficient way of comparing records would have been achieved.

With respect to claim 6, the combination of Livschitz, Yianilos, and Nguyen teach the apparatus of claim 5 wherein the determination that the network-copy database and the mobile-copy database are out of match is made responsive to said second hash (Livschitz, col. 6 line 34).

With respect to claim 7, the combination of Livschitz, Yianilos, and Nguyen teach the apparatus of claim 5 wherein the out of match database record retrieved by said processing circuitry comprises both said key field and said record field (Livschitz, col. 7 line 46-48 wherein appropriate data blocks are replaced).

**Claims 14, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Livschitz and Yianilos as applied to claims 1 and 15 above, respectively, and further in view of Boothby (U.S. Patent 5,684,990).**

With respect to claim 14, Livschitz and Yianilos do not expressly teach the apparatus of claim 13 wherein said database value updater operates pursuant to a selected conflict resolution protocol.

Boothby, however, teaches said database value updater operates pursuant to a selected conflict resolution protocol (col. 4 lines 39-49) for providing a conflict resolution strategy in a synchronization environment.

Accordingly, in the same field of endeavor, (i.e. synchronizing), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because the conflict resolution strategies provided by Boothby would have given Livschitz assurance of a consistent database should conflicts arise when a data record is updated (e.g. need disclosed by Livschitz, col. 5 lines 26-27). Further, Boothby would have provided user interaction over the synchronization process for the benefit of a user having control over the synchronization process. Thus, Boothby would have provided a method to give Livschitz consistent and coherent databases during synchronizations.

With respect to claim 19, Livschitz and Yianilos do not expressly teach the method of claim 18 wherein the selected one of the network-copy and the mobile-copy of which the portions thereof are caused to be overwritten is selected according to a conflict resolution scheme.

Boothby, however, teaches the selected one of the network-copy and the mobile-copy of which the portions thereof are caused to be overwritten is selected according to

a conflict resolution scheme (col. 4 lines 39-49) for providing a conflict resolution strategy in a synchronization environment.

Accordingly, in the same field of endeavor, (i.e. synchronizing), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because the conflict resolution strategies provided by Boothby would have given Livschitz assurance of a consistent database should conflicts arise when a data record is updated (e.g. need disclosed by Livschitz, col. 5 lines 26-27). Further, Boothby would have provided user interaction over the synchronization process for the benefit of a user having control over the synchronization process. Thus, Boothby would have provided a method to give Livschitz consistent and coherent databases during synchronizations.

Regarding claim 20, Livschitz and Yianilos do not expressly teach the operation of creating a change-history by indicating overwriting of the portions selectively caused during said operation of selectively causing.

Boothby, however, teaches the operation of creating a change-history by indicating overwriting of the portions selectively caused during said operation of selectively causing (col. 4 line 25; i.e. "synchronization depends on knowledge of (2) the history of updates in each database" and further col. 6 line 10-15; i.e. "for every desktop record, the synchronization program takes note of the record's status, i.e., whether a corresponding status file record exists, and if so, whether that record has changed) for providing a history of changes that were caused.

In the same field of endeavor, (i.e. data synchronization), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because Boothby would have given Livschitz a history of changes to determine what changes have been made and to keep track of those changes. Ultimately, in the database art, this provision would have benefited Livschitz in a way for backup in case of possible failure or other data loss (as taught by Boothby in col. 3 line 65-67).

**Claims 21, 22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Livschitz and Yianilos as applied to independent claims 1, 15, and 23 above and further in view of Ball et al. ('Ball' hereafter, U.S. Patent Application 2002/0120648).**

With respect to claim 21, Livschitz and Yianilos do not appear to teach apparatus of claim 1 wherein said first hash technique comprises a checksum process.

Ball, however, teaches wherein said first hash technique comprises a checksum process (0049, 0051) for providing a checksum to detect changes in a preliminary check.

Accordingly, in the same field of endeavor (i.e. hash functions), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because the hashing techniques as provided by Ball would have given Livschitz and Yianilos the ability to use

a first hash technique with small computational overhead to compute differences upfront (e.g. needed by Livschitz, col. 7 line 67). Further, with Livschitz (who is capable of using different hashing techniques – see Fig. 8) using the checksum (as provided by Ball) upfront, a system using a second hash technique when a stronger calculation is needed (see Yianilos, 0083) would have been provided for the benefit of saving computational costs.

With respect to claim 22, Livschitz and Yianilos do not the method of claim 15 wherein said generating a first hash further comprises generating a first hash pursuant to a checksum process (col. 2 line 22) for providing a checksum.

Ball, however, teaches wherein said first hash technique comprises a checksum process (0049, 0051) for providing a checksum to detect changes in a preliminary check.

Accordingly, in the same field of endeavor (i.e. hash functions), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because the hashing techniques as provided by Ball would have given Livschitz and Yianilos the ability to use a first hash technique with small computational overhead to compute differences upfront (e.g. needed by Livschitz, col. 7 line 67). Further, with Livschitz (who is capable of using different hashing techniques – see Fig. 8) using the checksum (as provided by Ball) upfront, a system using a second hash technique when a stronger calculation is



needed (see Yianilos, 0083) would have been provided for the benefit of saving computational costs.

With respect to claim 24, Livschitz and Yianilos teach wherein said second hash comprises a hash of a first key field of said database record ((Yianilos, 0085) for teaching a hashing function that hashes key fields) but do not appear to teach the mobile node of claim 23 wherein said first hash technique comprises a checksum process. Ball, however, teaches wherein said first hash technique comprises a checksum process (0049, 0051) for providing a checksum to detect changes in a preliminary check.

Accordingly, in the same field of endeavor (i.e. hash functions), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because the hashing techniques as provided by Ball would have given Livschitz and Yianilos the ability to use a first hash technique with small computational overhead to compute differences upfront (e.g. needed by Livschitz, col. 7 line 67). Further, with Livschitz (who is capable of using different hashing techniques – see Fig. 8) using the checksum (as provided by Ball) upfront, a system using a second hash technique when a stronger calculation is needed (see Yianilos, 0083) would have been provided for the benefit of saving computational costs.

***Response to Arguments***

Applicant's arguments filed 8/25/2011 have been fully considered but they are not persuasive.

As to Applicant's remarks on pages 9-13, Examiner respectfully disagrees for the reasons supported in the advisory action mailed 9/8/2011. For convenience those reasons are reproduced below:

On page 10 of the remarks, Applicant submits that a Livschitz second hash is not conditional upon the H function hash signatures being compared and an out of match condition recognized therefrom. Examiner respectfully disagrees and maintains that Livschitz teaches a recursive process that continuously computes hashes until a state of sync is found (col. 6 line 32) or the data blocks can no longer be divided (i.e. they consist of elementary data blocks - see col. 6 line 36-37). In Livschitz, H signatures for data blocks are computed (e.g. see col. 6 line 22). If an out of match condition is determined (col. 6 line 34 and line 44-45), another hash is formed (col. 6 lines 55-58. See also figs. 2 and 3 illustrating this process). Accordingly, Livschitz teaches generating a second hash when an out of match condition exists.

Further on page 12, Applicant argues that there is no difference in computation complexity. Examiner disagrees and maintains as set forth in the Final Office action (dated 7/1/2011, page 5) that Yianilos teaches two different hash techniques with two different "Big O" notations (i.e. that suggest computational complexity) and further that a

first computational intensity is to compute a summary while a second computational intensity is to compute digests for individual records.

Furthermore, Applicant's arguments on page 13 regarding the first and second message have been carefully considered as this subject matter has been entered. Those arguments have been respectfully found unpersuasive given the following:

Applicant argues that Yianilos teaches sending of a plurality of hashed outputs in conveying a first hash of a first complexity and uses paragraph [0085] in Yianilos to support this remark. Examiner, however respectfully disagrees because in Yianilos, the interpreted first hash technique ("Get\_Interval\_Hashes") transfers a summary [0083] wherein the summary includes a fixed size digest of records in the set of portions of one database in order to find discrepancies [0081]. Accordingly, a digest (hash)<sup>1</sup> is communicated in a first message (e.g. a summary).

Secondly, Applicant submits on page 13 of the remarks that Yianilos sends a plurality of hashed outputs in conveying a second hash of a second computational complexity. As noted above in the rejection, the interpreted second hash technique ("Get\_All\_Hashes") transfers a digest (hash) in a communication round [0083] wherein every communication round generates heavy network traffic [0085]. While it is true that Get\_All\_Hashes communicates in several communication rounds, Examiner submits that each round transfers a digest in order to identify each discrepancy [0083-0084]. Accordingly, because a digest (hash) from a second hash is transferred in a second

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<sup>1</sup> in Yianilos, a digest is a hash. See [0013]

communication, Yianilos teaches a second message communicating a second hash as claimed.

### **Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT TIMBLIN whose telephone number is (571)272-5627. The examiner can normally be reached on M-Th 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Cottingham can be reached on 571-272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ROBERT TIMBLIN/

Primary Examiner, Art Unit 2167